

Hawaii

Australia

New Zealand.

H. S. Ladd

5.

BERNICE P. BISHOP MUSEUM

HONOLULU, HAWAII

FIELD NOTE BOOK

Hanauma Bay Collecting Dec. 1, 1925
On fringing reef exclusive of shore rocks & beach

6 coral - probably all different
(made no special effort to collect coral)

3 cones - all appear to be same sp.

misc. { 3 gast. - same sp.
1 "
1 "

BERNICE P. BISHOP MUSEUM
HONOLULU, HAWAII

FIELD NOTE BOOK

Subject Geology

Locality: Hawaiian Ids, Australia (p. 30),
all Pac New Zealand (p. 59)

Member of Staff H. S. Ladd

Date Nov-Dec 1925

Shore gastropods

Limpets - large - 2

" small - 13

limpet ? - 1

black small 16

" mottled 11

speckled 7

plotted very small 5

dark - medium 20

(H. crab) small white 1

7

2

1

cowrie speckled 1

" mottled 1

green coral 2

- all above except 2 large limpets placed in
tubs with water

Memo - 30 ± spec.

Hanama Bay Collecting Dec. 1, 1925

On fringing reef - excluding shore rocks & beach

6 coral - probably all different

(made no special effort to collect coral)

3 cones - all appear to be same sp.

misc. { 3 gast. - same sp.
1
1

Plus large number of old shells inhabited
by hermit crabs - ~~the~~ black sp. with orange bands
on legs.

above Placed in pt. sq. jar - 3 corals separate
also hermit crabs

Note - Cannel box contains sp. from Koko
Head again collected Nov. 29 (Sun)
H. S. Laid

Left with Palmer
all cones collected
at Waitiki - Dec 1925

BERNICE P. BISHOP MUSEUM
HONOLULU, HAWAII

FIELD NOTE BOOK

Subject Geology

Locality: Hawaiian Ids., Australia (p. 30),
New Zealand (p. 59)

Member of Staff H. S. Ladd

Date Nov-Dec 1925

Itinerary (see also I.G.S. Notebook). ~ Oahu Nov. 25 - Dec. 23 ~ Oahu 1925.

Nov. 25. Arr. - Misc. - short field trip.
 26. Thanksgiving - Sightseeing.
 27. Office
 28. Field - around Is.
 29. Field - Koko head
 30. Office

20 Field & vacation
 21 Office & Fish Work
 22 Vacation and preparation to leave.
 23 " " " " " "
 24 Preparations to leave - sailed 7⁰⁰ P.M.

Dec. 1
 2 Hanalei Bay - Reef work.
 3 Fish Work
 4 Fish work
 5 Office 1/2 day
 6 Field - near Alaia Pt.
 7 Office & fish work
 8 Office
 9 Office
 10 Office & Fish work
 11 Fish work
 12 Field - Dr. Cooke in A.M.
 13 Fish work and Field - Ewa coral plain
 14 Field - Waikiki reef and office
 15 Vacation - married
 16 " , passports, etc.
 17 " , office.
 18 " , passports, etc.
 19 " " "

Totals:
 1) Days in field ----- 6 1/2
 2) " " office ----- 7 1/2
 3) " on fish work ----- 5
 4) " sightseeing and vacation -- 1 1/2
 and preparations to leave. 3 0

Days in Honolulu ----- 30

Nov. 25.
Short field trip - see I.S.S. notebook 91-92.

Nov. 28. Auto Trip around Island - all day trip.

Started out in Palmer's car. Followed road leading up Nuuanu Valley - long grade to Nuuanu Pali. (2 pictures here). The road here passes through a deep notch in the Koolau Range. The power of the wind blowing through the notch is very great. It frequently takes off the tops of touring cars. A steel cable along the cliff enables pedestrians to hold on!

From the road immediately beyond the crest of the divide one obtains a wonderful view of the ocean and the land intervening between the Koolau Range and the shore, also the cliffs to the NW. Dike cut the basalt at a number of places along the road.

The road in this section is nearly paved - an excellent road. Many pointed rocks finally land one at the base of the pali. Here a new road (not shown on U.S.G.S. topog.) leads toward Waimanalo. Much of the low land here is covered with sugar cane. Crossing in Waimanalo we took the old road back to the base of the Pali.

Rabbit Id (Manana Id) was seen. It lies north of Makapuu Head which forms the eastern tip of Oahu. Rabbit Id appears as a semi-circular crater with its highest point to lee of prevailing trade winds. It is an ash crater & most of the ejecta was carried to the SW by the NE trades. This is generally true of all the ash craters on Oahu.

Returning to the base of the Pali the fluted basalt cliffs of the S.E. part of the Koolau Range are well shown. Palmer believes these steep fluted cliffs are due to the constant rainfall in small joints - possibly enlarging master joints in the basalt. Same thing seen on a small scale on other side of island.

Picture of hatchet-headed mt (Puu Loa or one near it - see Palmer). Through deeply laterized cuts. Soil brilliant red or brown in color due to various oxides of iron.

Palmer does not think much of Davis' recently published opinion that the Koolau range is part of an enormous crater whose other side (if it ever existed) lies beneath the sea. Wonder what soundings show. It is highest to leeward all right.

Along main road following shore line (see Hawaii Tourist Bureau map) to Kowale Bay on the west side of the northern tip of the island. We ate lunch and examined Lithothamnion reef. There algae appear as rough concentric masses of ls. a foot \pm across. Corals comparatively rare. Minute gastropods abundant but collecting on the whole is very poor. The tide is only about one foot or so & this is probably the explanation. Bivalves collected from shell heap. Calc. sand is light brown in color & contains many shell fragments. The fusate bench is well shown - it seems to indicate a lowering of sea level of about 15' in recent geologic past. W. & P. believe present ice cope rock much less extensive recently.

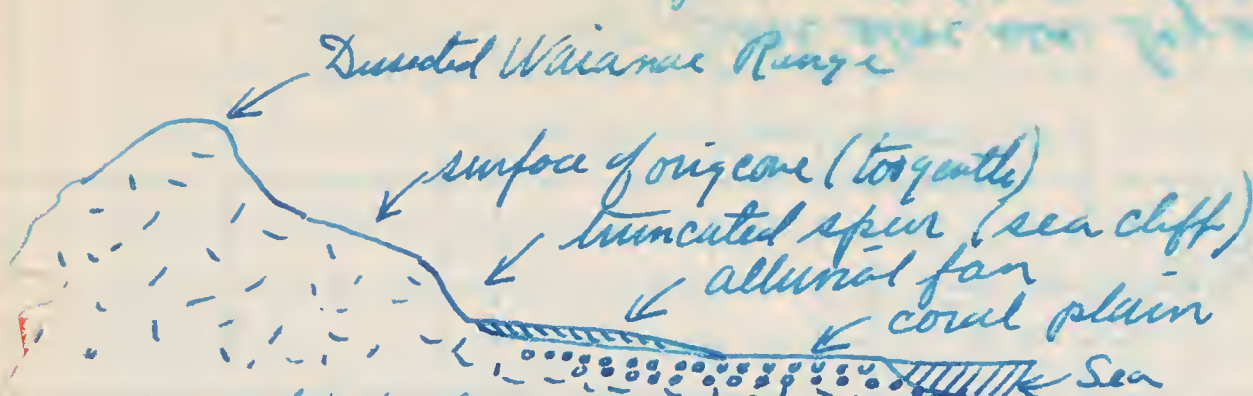
Lithified sand dunes observed at several points along northern coast.

On around to Waialua & visited cane plantation. Saw loading of cane.

Picked up McLean (one of Palmer's students) & cut across island to Pearl Harbor. This drive was across a youthful upland - great fair apple country. Some of the water comes through a tunnel over 1000' long through Koolau Range.

Some interesting geologic & physiographic features may be seen by looking from the Waialua Plantation toward the Waianae Range. At least 7 different kinds of surfaces

may be seen - as follows:



1. Dissected hills of Waianae Range
2. Remnants of old cone (between young valleys)
3. Young valleys
4. Sea cliffs at spur ends
5. Alluvial fan from mouth of young valley
6. Arroyo cut in center of fan
7. Coral flat - to shore.

Beautifully developed spheroidal weathering in basalt seen near Waiakakalua gulch. Rock deeply weathered - all stages observable. Where only a few spheres remain in red-yellow-brown matrix the rock has the appearance of conglomerate or agglomerate.

Canters left by tree trunks seen along road at Red Hill, Kalahe. Two pictures here - later in P.M.

Stopped at pumping sta. Saw Pearl Harbor, etc. - on to Honolulu.

Nov. 29. Koko Head Trip with Palmer class.

Drove east from Honolulu along Mānana Bay beyond Kūlāpa Pond. Left car here & ascended ridge turning east at top and following secondary road (see U.S.G.S. map). At a point at the head of Mānana Bay (on ridge) we stopped to collect small quartzite ls. $\frac{1}{2}$ " \pm in length. The rock here is ash & badly weathered. In the loose stuff in the depression between the overlapping beds the ls. are very abundant (see spec.).

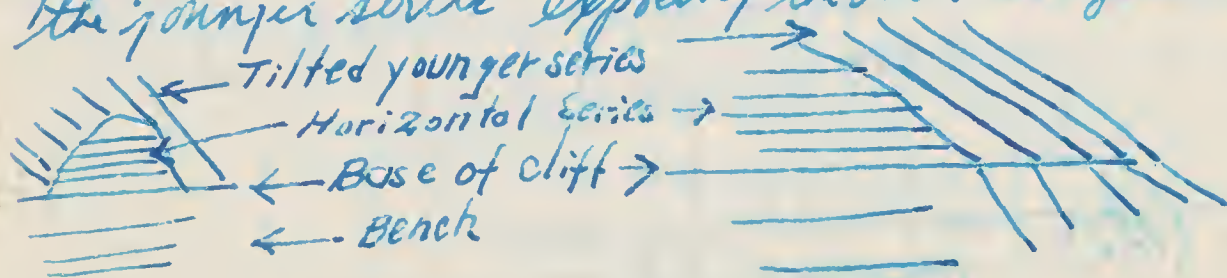
Before descending to the shore at the head of the bay we observed a lava flow - brown

porous, rough material. This is one of the "14 points" -

Along a line drawn almost straight from Rabbit Is. on the NE to through Koko Crater to Koko Head on the SW. calcamine is known to have broken out in at least 14 places. A number of these were seen & several closely examined during the course of the day. Koko Head, Koko Crater, Rabbit Is. and a small unnamed crater (appearing as a hill on the USGS map) between the last 2 and largest.

Beautiful view of undulating reef in Hanauma Bay seen from above (picture). Descended to water's edge - saw bidded ash & lava flow at head of bay. Occasional large fragments of igneous rock & coral are found in ash. These were evidently blown from the walls of the conduit during the eruption. In many places they struck with such force as to depress the bedding planes noticeably.

Continuing along the shore a beautiful unconformity is seen between two series of ash beds on the NE side of the bay. A knife edge contact separates the older horizontal beds from the younger tilted beds. If the older ones were tilted it would look "just like the pictures in the text books". The escarpment bench is well developed here and the unconformity can be seen both in the vertical sea cliff and in the horizontal spar cut terrace. Small valleys cut in the horizontal series are seen filled with rocks of the younger series. Further on "windows" are cut through the younger series exposing the older horizontal beds.



Followed along bench above sea beyond Koko Crater. Stopped above bay (immediately S. of blowhole)

to eat lunch. An arid district with fantastic wind erosion. Blow hole caused by sucking of soft bed & breaking through above. Small waves force out air & spray - big waves cause spout of water. At one such point erosion has forced up erosion of hole & much effectiveness is lost.

Fauna observed. 1) numerous echinoids of at least 3 types or species (a) flat spined purple, (b) round spined purple (c) round spined green. These make deep pits in rocks and seem to be an active and important agent in rock destruction. The only molluscs observed were some 9 or 10 sp of gastropods (1 large limpet, 2 Cypraea, 2 Murex-like small sp, etc. - see spec.). See ammonites rare. Coral frags abundant. The fauna in the strong surf must be rich. A poor coast compared to Fiji, etc. but better than that seen yesterday.

On to small crater previously mentioned. It is very perfect in shape - about 1000' across & some 30' deep (i.e. below lowest point of rim). Composed chiefly of basaltic lava (containing some olivine) - very porous & very rough. At one point pseudo-glacial striae were observed. These were due to hard fragment passing over cooling but still plastic lava. A small amount of ash on the leeward side may represent last spasm of small crater (Palmer) or may have come from Koko Crater (CKW).

The journey from shore to small crater was made by ascending first a gently sloping alluvial fan & then the rough sea surface of a lava flow.

From this crater a good view of Koko Crater could be had - looking into it from the low windward rim also by looking in the opposite direction (NE) another of the "14 points" could be seen - a hump of lava with a "trace" of a central depression or crater.

On both of the above trips much beautiful and unusual vegetation was seen. The light green patches of the cucurbit? trees stand out among the darker green of the other vegetation giving what McCoy has called "tapestry vegetation" - a clever descriptive term.

Dec. 2.
Spent real reef work. To Koko Head region with Palmer & Stone. They left me at Kihuna Bay about 9:30 - worked there until 2:30 P.M. One can wade out on reef to its outer edge. The bay is only partly filled with coral - in between the more or less continuous patches are deeper sandy pools of various size. There seems to be very little ground coral. Had no glass-bottomed box & hence did not collect as much as I might have otherwise. Conus, Cypraea, etc. not common on reef. Quite a series of shore gastropods (mostly small). No pelagopods. Total of over 20 sp. gastropods and half a dozen corals.

Dec. 6.
With Palmer & Stone to latter's country place near Alulu Pt. (somewhat less than 1 mile NW of Pt.). Tramped about in morning & collected few things from raised reef (about 5-10' above high tide). Material well preserved & abundant. A lot of similar stuff from road material nearby. In some some of original color is retained. Saw much lithified dune sand, weathered basalt, etc.

Palmer believes that the vents from which the lavas (that now make up most of Koolau Range) came lie some distance north & east of present cliff. This formed an enormous dome (not a crater) part of which folded later leaving present remnant. It then is a fault scarp which has been eroded to look some distance.

The depression now occupied by Kaelepulu Pond is a drowned valley. The low scarp N.W. of the pond may be (probably is) a sea cut cliff or a river cut cliff. The rock is lithified dune sand - shows much undercutting forming caves. No elevated reef seen except along shore.

Dec. 12.
Field trip in morning with Dr. Cooke. Drove in his car up Manoa Valley & to point near top of Tantalus - hence to summit & around rim of this old crater. No rock is exposed - small overgrown with vegetation - much grass & low underbrush, some trees - among them patches of native forest. This area is now a forest reserve and much planting is being done. Some years ago a shallow lake existed in the crater - now dry.

The purpose of the field trip was to introduce me to the methods of collecting land shells so that I may do this work successfully in Fiji. Shells were found in some abundance under various conditions. In general one should search in protected places - i.e., protected from sun & rain. The tree or arboreal species are found on the underside of the leaves, especially where leaves are thick & close set. The under side of limbs & the bases of trunks are also good places - loose bark, cracks, & rubbish at foot of trunk. In low brush one must get down & look up - turn back leaves of various plants (especially thick broad ones), some ferns good - also look for petioles of leaves - where leaves join stems. Stones should be turned over. - These & other loose stuff near gardens give good results.

It takes a practiced eye to pick out these shells & Dr. Cooke did most of the collecting - though I improved after the first few minutes.

Land Snails in general are common in the tropics & not restricted to wet places as I had supposed. Many species are very restricted in their distribution. Most "species" have numerous varieties or "geographical races" that are exceedingly restricted - each one being characteristic of one hillside or even one tree (colony). For example a given species may be distinct on one side of a gulch & similar on the

other! Certain shell form (i.e. proportions of length to breadth, etc) are very characteristic of limited areas. "Color forms" of a given species may be mapped! These last are evidently rapidly-running mutations - offspring of a single individual for their shells are hemispherical & fragrant most of the time. The many facts known about the distribution of land shells seem to show that they spread with exceeding slowness for it seems that many closely adjacent colonies have remained isolated by simple barriers long enough to develop definite characters - in many cases of specific importance.

The distribution of these various "geographic races" on a single island ties up with the distribution of genera on different islands. Thus in the Hawaiian group where the shells are fairly well known Dr. Cooke believes he can work out the sequence of separation of the different islands rather accurately - assuming that they were once connected - a ~~of~~ belief that most scientists (at least most geologists!) do not hold.

Dr. Cooke does not believe in the "drift theory" nor any other of the same class. He believes in land connections & states some remarkable evidence of distribution to back up his belief.

It is a pity that no one has succeeded as yet in raising land shells in the laboratory because such studies should throw valuable light on their migratory power, rate of mutation, etc. It seems a strange fact that certain species have migrated all over the Pacific within the time of man.

Preparation -

Drown in water 12+ hours - then shells snails in extended condition. Place

in 40% alcohol for at least several hours. Cham - (pull large ones, squirt small ones.)

Equipment

1 gross nails - 3 sizes { $\frac{1}{2}$ gross 2 dram.
bal. 144 " $\frac{1}{4}$ "
(see boxes)

See Cooke. ✓ alcohol. (Ball's kit)
✓ labels.

Cook advises emersion in 50% alcohol after drowning. When shipping dry on off alcohol & wrap label around bottle - pack well.

Sun Dec. 13.

With Palmer in afternoon to Ewa coral plain. Drove to Gov. Mag. Sta., parked car and walked toward the sea over rough but level coral plain.

Dead shells of thousands of land snails cover the ground so that a handful of the loose stuff reminds one of the deep. faunas - at least as far as numbers are concerned. A few living specimens are to be found around the trunks of low trees but the land snails practically disappear when the bulk of the vegetation was cut off. This was done fairly recently to grow sugar (or ip) & some plants still remain.

The coral rock itself is gray tough fls. - white on fresh surface. Fossils are not abundant except locally. Upon finding good blocks we sat down & cracked rock. Quite a fauna resulted. A tridacna is most abundant species (see opercula). Corals, cyprinae, canis, etc. also found. Crushing & washing blocks would give good results - some rock collected for this purpose.

Dec. 14 - Mon.

To Edmondson's lab. at Waikiki. Collected on fringing reef with Dr. Edmondson & Mr. Ostergaard. Used a glass bottomed

box for the first time - will never go out
without one hereafter. Edmondson plus
takes a short crawler with him. Saw
his corals set in cement blocks, & many
others, sponges, stars, sea cucumbers, cones,
corvins, etc. etc. - but collecting thus far.
- especially good close to shore and along
rocky wall.
Today Ostergaard's collection of
gastropods. He is especially interested
in genus *Gypraea*. (And no wonder!).

Dec. 20. Trip to western side of Oahu with
Stokes - around southern edge of Waianae(?)
mts. Good collecting along shore from
raised reef - see map.
Eustatic bench well developed, in
one place shows beautiful desert varnish - polished
by coral sands.

Departed for Fiji Dec. 23rd

(255)

Ladd

I

1925

255

Ladd

I

1925

Feb 23rd (Tues.)

Arrived Sydney - landed at famous
Circular Quay about 1:30 P.M. To Metropole
& Australia but both were booked full.
Took double room at Carlton 4/6 each
& no frills, bath! (including
breakfast, however). Also taxi & car.

Feb 24 (Wed) to Feb 2 (Thurs)

Stayed at Empire Hotel - 8/6 each per
day with breakfast. Tram ride around
town, letters, typing etc.

- Feb 3 (Wed)

To home etc - 14-10-10 per day

General:

The city of Sydney is located on a tongue of Triassic rock (chiefly sandstone). This tongue borders the eastern coast of N.S.W. for some miles north & south of Sydney and is projected to the northwest. Other outcrops occur in eastern N.S.W. The Triassic divisions as given by C.A. Süssemlch (Intro. to the Geol. N.S.W. - Syd. 1914) are as follows:

Triassic & Tertiary Series	Talbragar Series	
	Artesian	"
	Clarence	" { Upper Clarence - sh., etc. Middle " ss. Lower " ss., sh., coal & cong.
	Hawkesbury	" { Wianamatta Stage Hawkesbury " Narrabeen "

The rock in & around Sydney is said to belong to the Hawkesbury Stage - consists mainly of massive sandstone & grits (1100' at Sydney) - occasional thin beds of shale - occasional beds of carbonaceous shale - often containing plants, fish & fresh water shells. - see p. 159-161.

Bondi - visited quarry in typical sandstone and upper part suppressed and at great thickness of beds. Süssemlch says sometimes they reach 60' in thickness! The main bedding planes

are regular. The stone is easily worked, light tan in color, & darkens rather uniformly with age. Does not seem to streak & stain as much as our Bedford stone.

La Perouse - Mar. 4th (Thurs).

Good exposure at cutting at end of tram line. 40'± exposed, coarse ss. with 8-10' of carbonaceous shale included a few feet above the base. The lowest few inches of shale contain thin layers of ss. less than 1" in thickness. - good example of gradually changing conditions. Sand grains angular (not sharply so, however) - cross bedding very well developed. Columnar jointing at top of exposure. Süssemlch explains this as follows: Great dike upraised, saturated ss. - corrosion currents heat ss. for some distance & expansion occurs - later contraction & fracturing. Saw no evidence of dike at La Perouse - no fossils seen.

Sandstones beautifully exposed along the coast near La Perouse - opposite Barell Id. Wave dips are high & cross bedding the rule. Wind & wave have eroded beds into fantastic shapes - ridges, pits, haystacks, haystacks - all are there. Took photo.

Same locality is rich in marine molluscs & other invertebrates (modern). Despite laminae & chert are very numerous; corals, gastropods, & 5-rayed starfish, etc. & dated series of common forms.

Mar. 5th Fri. To Sydney University to meet members of geology dept. L. G. Cotton is head but

he was not in. Met Dr. Waterhouse
(Economic - 3rd in dept.) Dr. Brown (2nd
in charge - Petrology) Dr. W. Woolnough
(who is no longer connected with Univ.) +
Mr. Osborne (or Osburn - a young chap newly
appointed. Had long talk with Woolnough
who approved my Fiji plans. Recommend
careful working off Sengatoka valley.
He will deliver paper on Fiji + N.S.W. Crds.
before I leave. He has worked a great deal
on N.S.W. Crds. Discussed photography in
evening - put film box in tea container - make
double time for carrying film + camera -
weight 10 lb. I used plates - use Instamatic
against this grade. Write to him.
Dr. David or Prof. Emerton - was in town
not alone.

Woolnough gave me letter to Mr. E.C.
Andrews, Asst. Geologist, Mines Dept. Sydney.
Mr. Dunn is govt. palaeontologist (good
routine man but not an enthusiast)
or palaeogeography has been done with palaeontology
in N.S.W. That of Victoria worked up
better.

Am to see Waterhouse Wed. - meet
Prof. Cotton + Waterhouse's brother (Agr. Dept.)
who has lived 2 yrs. in Fiji teaching
them agriculture, etc. - kind of missionary.
(S.L. Waterhouse tel. 53916.)

Law Trassic fish + Insect remains
from green shale at Brookvale - quarry
north of Sydney.

Mr. Osborne wants H. indesite from
Fiji - will send note.

All members very kind in suggesting
types, etc. Sydney Univ. has best
grounds are poorly cared
for. Am to see dept. in detail Wed.

Mar. 6th Sat.

Hard about town till noon. Change of
sh. looking, got permit to land in N.Z., etc.
are now booked on the "S.S. Ulmaroa"
(what a name) - a very fine
vessel. This is a 1 x 3 class boat - hence
we go 1st + pay 10 of extra each. She is a
much smaller boat than C.A. liners
+ this the roughest part of the trip from
Sydney.

Met Kate Downie, Lani + another
chap in charge of the "Lani".

In the P.M. Kate took us across
the bay to the zoological garden at
Turonga Park. The gardens are situated on
the rather steep st. hills rising from
the water level of the harbor. The path
to the top winds back + forth across
the hill with the zigzag arrangement
of the loops - there are quite two miles
+ least of each per - about 100 ft.
Lots of bar-bes cages. The entire grounds
are very well laid out + fully well
equipped. Their bar-bes are not as
carefully made as those in St. Louis
but on the whole they are fair enough.
The collection of animals + birds, etc. is
large + very interesting. Most beautiful of all were
the cages of brilliantly colored birds.

Back to flat + Dave for tea after which
he + his wife took Mike + me to see
Sam + his wife. Supporting
act, only fair. - Should himself be a real comedian.
A bit more vigor than Cyprian.
In State but not too much so.

Sun. Mar. 7th

Slept late. Official work of several
sorts + went to Australian Museum.

in P.M. for couple of hours. It is located, a beautiful brown sandstone building on the east side of Hyde Park in College St. Their collections on the whole are complete, well exhibited & well labelled. The arrangement might be improved in some ways & in the geological section the lighting is very poor. Especially attractive are their anatomical collections (birds etc.), Australian animals & birds, & their numerous special exhibits. There they have a whole case of miscellaneous items labelled "Attack & Defence" - here are armored fish, porcupines, etc. Collection of "Australasian" marine invertebrates is very large & well labelled. Among the Australian animals the giant kangaroo (a restoration) over 15 tall, the wombat, fruit bat, kangaroo, wallaby, etc. are well shown. The

museum issued a good little magazine - see copy purchased for me

The museum building was well patronized the day of my visit. It was Sunday - museum open from 2-5.

Among the mineral specimens were a series of casts of famous Australian nuggets - including the "Welcome Stranger" weighing over 2,000 oz.

Mon. Mar. 8.

Typed & sent letter to Guyer.

Called upon Mr. E. C. Andrews, prominent geologist & presented a letter of introduction from Dr. W. A. Woodhead. Talked with him for an hour. Mentioned his early paper on Fiji - he regards them as juvenile attempts - for no reprint. Give me a copy of his Proc. Address to Royal Society 11 Sept. 1922 - A Contribution to the

35

Hypothesis of Coral Reef
Formation". Discussed the origin
of reef. He believes in erosion
platform stable through the Pleistocene
in many areas. Believes there is
no Pleistocene ~~rock~~ in Viti Levu (accepts
and of Palaeozoic ~~not~~ ^{not} ~~area~~ of
difference of opinion among them. Believes
amorphous embedded ss. of Lau Group
to be Pleistocene which fossiliferous
large gastropods bedded rock
below is Tertiary. Would like
to return to Fiji but is too
busy with routine work to do
any research. If Palmer & I go
to him he recommends Turakau
Thuthia (Cicia), Qilagila, Vanua Malakau,
Mago, & Kaba. Which in Fiji
he did little in Viti Levu.

He impresses me as a fairly
capable man but I suspect

that he is not really enthusiastic
about research. Thinks a deal
about his position & the fact that
he does not have a D.S. degree.
Proudly exhibited photos of American
geologists (Storoy, Fenneman) duly
signed to him. Boasted a bit
about his climbing achievements.
Pretended to know quite a bit about
America. As I left he asked
me how long I had had my
degree, etc. I confessed to having
got a graduate. Said he did not
have a degree - I laughingly
remarked that he "didn't need
one now" - he fairly purred!

Dave came for lunch. To
Mineralogical Museum on
Go. St. in P.M. Beautiful collection
of Australian minerals, models
of lodes, geological relief maps,

etc. The last named are very
instructive. Have never seen them
in the States. A large no. of
all Australia have a notice on it
to the effect that it is very macerated
in large masses in the interior
are practically. Collections of fossils
are few - Of Ordovician only
graptolites - or silvery carbon films.

Collections of opals & opalized
material are beautiful - some
wonderful opalized fossils - most
of them from Victoria. (?)

Met Mr. Lawrence on street.
He came over in evening for
lodge.

Wrote long letter to Pop - chiefly
about expenses. To bed for 3 hrs.

Fine March 9

Up at 5:30 & to Belmore

By 7:30 have drove us about
suburbs. Then headed south to
Bulli. Beautiful view from
"Lubline Point" - 1000 - to 1400' above
sea - sheer rock walls for hundreds
of feet - long train puff through
miniature village & black specks
in white surf are balcons - curving
brown beach, white surf. Blue
water & red roofs of hundreds
of houses.

In a plunge in surf &
dinner in Bulli. Struck inland
& returned through Campbellville, etc.
Atmosphere hazy due to bush
fires. Every thing very dry. The
country is peculiar - open fields
of short & crooked trees - little
low brush - all seem to have
burned at some time or
other. Drove for supper &
home to pack.

Wed. Mch. 10.

Up early, closed flat & left about 9⁰⁰ from Charlie House on Lancelotti's Carve trip. The carve themselves lie over 100 miles west of Sydney. Our route for the first few hours lies a little north of west. Our destination today was the tourist town of Katoomba, which we reached shortly after noon.

The drive thus far has not been at all unusual from a scenic point of view. Most of the hills are low and gentle. Distant view obscured by smoke from countless brick fires of all sizes. Road fair - day clear & rather warm.

Stopped for "morning tea" en route at 11⁰⁰ a.m.

Car a beautiful blue & white holding 20 passengers in comfort. Two jolly, gossiping tourist females behind me & a female man with a poodle dog on one's right (poor imperfect thing!)

Took quarters at the "Springhill" @ 10s each per day (Am. plan). Food only fair. Around town & out to see scenery in P.M.

Beautiful valleys have been carved in the high plateau on which the town is built. Some of these valleys are fully 1000 feet deep - hundreds of feet of sheer rock exposed above the wooded talus slopes. Pinnacles & isolated chimneys add to the beauty of some of the cliffs.

They call this area the
"Blue Mountains" - Blue Valley
would be a more appropriate
name. The blueness at the
present time is due chiefly to
smoke from bush fires.

Rock near Katoomba is
chiefly coarse ss. with ferruginous
seams. ss is wht or tan - some
red & brown. There are some
beds of conglomerate containing
pebbles of clear, milky, & smoky
quartz. Locally cong. also is
cemented by iron oxide. ss & cong
both are probably Triassic. Older
rocks may be exposed in
deep valley bottoms.

Passed much Triassic(?) shale
enroute from Sydney to Katoomba.
Letter to KLU, notes, etc.
Thurs Mar 11.

With Mike over most of the
ground I traversed alone yesterday.
Back to hotel & checked out.

On bus at 1st for Jurlan
Cave. Dinner at noon at Blackheath.
More of the same type of
scenery as that seen about
Katoomba. 1200' valley with
vertical cliffs & steep wooded
slopes below. Woods fairly
open due probably to bush fire
at fairly regular intervals. Several
species of gum trees make up most
of the forest - these are medium to large
& white trunked (bark peels off).
Highest point on road in Blue
Mts is 4,200' above sea (highest
point in Mts is 4,800'). The
route taken by car is said to
be a good one across "mts", descended
in 1813 & road made shortly

after. Stopped at volcanic mounts
which are really high peaks on
the general plateau area - found
fossil ridges mostly - finally
descended - across low area -
climb - now have 14 (T.).

Kindly by steep winding road we
drop 1500 in 5 miles & arrive
at cave & enter beautiful tourist
hotel with all comforts of such
place - including high tariff!
Lodging through arch way ahead.
Letter to Ray Marshall.

Fri. March 12.

Early morning walk to "Carlotta
Arch" - found Sil fossil slabs, etc.

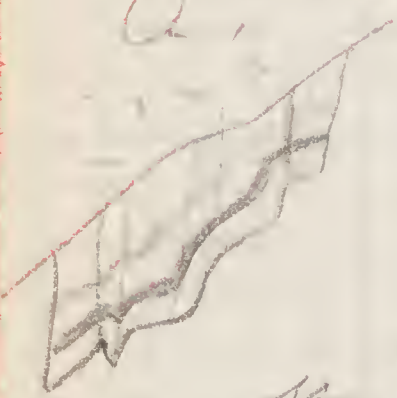
Picture & walk after breakfast
to "Linda Coach House", etc.

Through "Orust" cave in
the P.M. Trip took a little over
2 hours. The cave entirely beyond

my power of description! It is
a newly discovered cavern - fresh
& unexplored. The lighting effects
add greatly to the cave beauty &
cement walks & stairs enable one
to traverse it in good clothes.
Guide efficient, not loud mouthed
& quite intelligent.

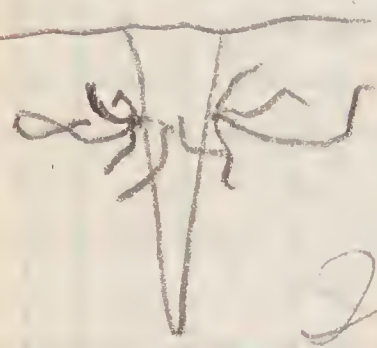
Caves of Orust proper are not
large but are tortuous with many
steep ascents. On the whole the
cave floor seem to bear real
relation to the bedding planes of
the highly tilted ls. The cave
is interesting chiefly for the
abundance, delicacy, & color of
its depositional features. In
many "rooms" very little cave
rock is exposed. Stalagmites,
stalactites, sheets & pillars are present
in unusual variety. In addition

there are beautiful "shards"
of argonite stand with shades
of brown // to depositional edge.



There are very thin
+ thrown into folds.
Another unusual feature
is the so-called "mystery
figure" - curved ^{straight} projection sticking
out at all angles from stalactite.
Often the perfect at first & curve
in a horizontal plane - even
forming a figure 8! The
maintain the same diameter
a taper slightly - they are
circular in cross-section. Your
quack tells you that they have
stumped everybody + uses
a mixture of big words - hydrostatic
pressure, crystallography, etc. + cry you
your "oo-o!"

At first I considered them
rain fillings left by solution of
surrounding rock (say suggestion
pute occur in roof ls. of main
arch) - then resorted to freak
crystallization - which undoubtedly
will explain them satisfactorily.



(see ahead - notes for
Mch. 14)

In evening, ^{danced (once)} played bridge
with Mr. Watson (who with his
wife ate at our table) + Mr.
E. L. Savage of Adelaide. The
last named I very like of
Watson + mine.

Sat. Mch. 13.

Up just in time for
breakfast. Through Lucas cave
- large - much bone rich
+ fallen blocks - broken columns, etc.

Constant "Now cast your eye
to the --- This is what we
call ---" gets my goat!
Beautiful buccin exposed in
cave roof at one point.

Through "Left Imperial"
cave in P.M. - a beautiful
cave but lacking the freshness
of the "Quint." - great variety
to splendid coloration in tone
of white, gray, brown, & red. Steel
lights certainly aid in showing
up the colors! Saw a spotted
snail & a free antine which
had been fished a bit but there
seems to be very little of them
& then only in the older caves.
Abundant *Habypates* in reef at
one & two points. Some of
deposited material has broken
down in air & become soft

- some is flaky (quite common
latter is strontium carbonate).

Ridge before & after supper &
a fence.

Sun March 14

Early morning climb to hill
top for pictures. 2 of well known spots
are quite tame everywhere about
Cedar House - very like like
chipmunks of Long Peak.

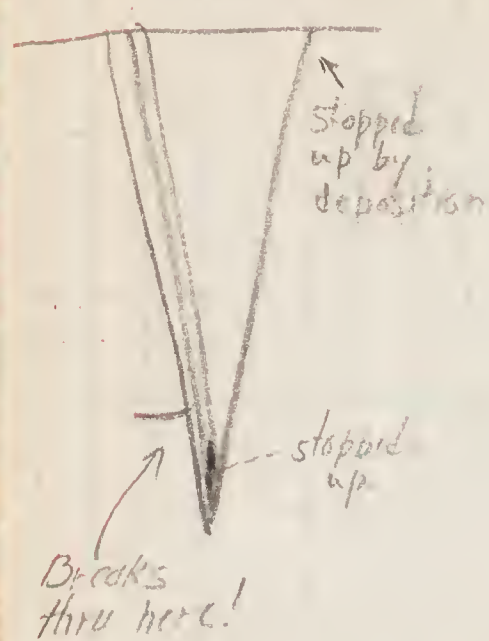
Also took pictures of fluting
in ls. - These are very well developed
on hill top. Channels up to inch or
in width & perhaps half or deep.
Intervening ridges very sharp. They
are undoubtedly due to solution
by almost pure rain water. They
never appear on flat or vertical
rocks but on exposed faces
at $45^\circ \pm$. - cf. fluted cliffs of
Oahu!

Talk with ancient head guide,
Mr. Whybrow. What I had
introduced myself before - a
very interesting fellow with quite a
knowledge of geology, but one
not trained in the subject.
Saw with him a piece of
andesite (?) intruding lime which
has been metamorphosed to
a mica schist (?) near the
contact. Intrusion seems // to
be well folded.

Many fossils - *Stomatopora*,
Tarantula, *Halysites*, *Crinoids*,
Ammonoites, etc.

His theories regarding the
origin of the "mystery figures" are
interesting. He rightly lays them
to peculiar crystallization
- his favorite is a peculiar

faulty modification - as follows.



A thin normal stalactite
form - bottom sealed by
deposition - sides built
out to form broad-based
pendant - side openings
closed (against pressure!)

+ water bursts through
wall of stalactite to give figure
a right B - later curved due
to peculiar deposition (which
alone could explain the whole
thing?). He could not see
my argument that the water
(as the pressure rose) would first
break through base of stalactite
so recently sealed!

By car back to Sydney
& into Kims Flat again. Good
valley scenery at Echo Pt., etc.
near Katoomba.

Mon. March 15.

Excursion about town in A.M.
& typing in P.M. Mr. & Mrs. Sarge
& Mr. & Mrs. Watson here in evening
for cards.

Tues. March 16.

To Belmore early & met Gen.
Dorome who drove me north to
Iron Tite Company's plant at Enfield.
The works are located on the
right bank of the Cooks River
~~just~~ south of main part of town.
Spent the entire morning with
the manager Mr. J. Knowles
had lunch with him. Also met
one of company's owners, Mr. K, etc.
Mr. K. is much interested in
his work, knows some geology,
& seems very capable. Plant is

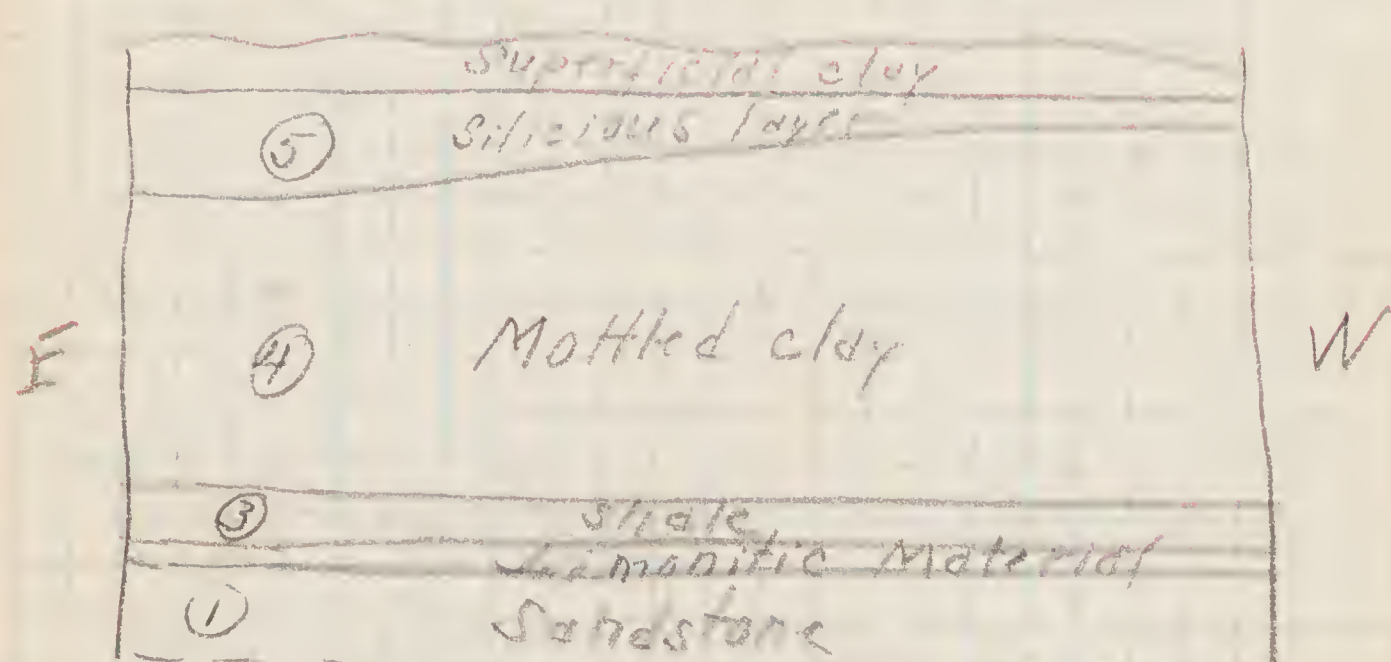
old fashioned but seems to be
operated well.

The pit exposes about 20'
of material. It is roughly oval in
outline & quite large. (Plant has
been in operation about 9 years).

The main floor of the pit
is composed of ^③Chocoma, gritty, well
bedded shale which contains
abundant plant remains in the
form of carbon impressions (at least
one fish has been found here). Locally
this shale is colored brown by iron.

Underlying the shale is a 4'
band of lenticular material &
below this is ss. ^①The latter is
exposed for 2' & Mr. K. says
he has drilled into second pit
more. The ss. is soft & friable
composed of white, yellow & red grain
with occasional flakes of muscovite.

quartz fine & angular - fairly well bedded.



Sketch of portion of pit wall - Vert. scale 1 sq. = 2'

Alm. shale is main body of mottled clay which is arenaceous, ferruginous, & contains few muscovite flakes. Mottled color (pink, gray, red brown) due to iron, which however is not present in sufficient quantities to color an entire burn properly. Some 10-15' of this are exposed. At the top is a hard siliceous layer thin at the

west end, & more even, & more even; this layer is quite resistant.

Alm. in superficial clay bearing iron fumes of iron oxide.

No fossils were seen except in the chocolate shale. Locally the main body of clay is well bedded & contains considerable mica.

The outstanding characteristic of the entire exposure is its variability, (when compared to Paleozoic sea beds).

The manager is having difficulties. He mixes 10% of the superficial clay with the mottled stuff (to give it color). This does not give it enough for the entire burn. In his down draft kiln lower tiles are too light in color & if he burns them properly the upper ones are too dark - hence the lower ones have to be burned

55
a second time - placing them
on top of the second burn. If he
mixes too much of the colored
clay in the bucket - if he
mixes too much of the hard silica
stuff. They do not shrink properly
& are too porous. What he needs
is a coloring clay for his lower
tier of tiles in each burn.
etc etc etc.

Plant.

Clay blasted, hand loaded into
barrow & wheeled to car - hauled
out of pit on cable & dumped into
a hopper - crushed in revolving circular
bin under two large whale - sifts
through floor of bin & is automatically
hauled aloft & saved (coarse stuff
returning to crusher). Fed into
cylindrical mixer & squeezed out
in parallel slabs - these are cut

to proper lengths & unmade
by hand. One block at a time
is fed to revolving press (each
press contains several dies) & stamped
wet tile is removed by hand on a
wooden rock. These stacked &
dried by hot air from kiln. Then
scrapped with knife & burnish.

Partly colored tiles are glazed.

Net waste is about 14%
when it should be about 9%.

This due chiefly to difficulties with
clay and poor draft kiln. Demand
for roofing tiles here exceeds supply
& competition is not keen hence
the company can still operate at
a profit but not indefinitely.

Went to Kimball's to Victoria Hotel
with Mr & Mrs Watson to meet the
Savager in Mr. Budge, Camille,
Prune & "American Waffler".

Wed. Mch. 17.

To Sydney University in A.M.
Met Cotton & others who showed
us about & took us to lunch.
Buildings are beautiful with
high arched ceilings, stained
glass windows & carved ss.
Climbed to top of main tower
visited beautiful library & Great
Hall. Cotton, Waterhouse, Osborne,
Miss Brown & Miss — Mike
& I. Arranged to meet Mr. Deane
share talk. To Mining Museum
balance of afternoon with Curator
(a good mineralogist) Mr. Cerd.
Obtained good material.

Mr. & Mrs. Watson here for
copper - to see "White Cargo" & friend
Mr. Leon Gordon, author, has
the leading part - a splendid

play though the theme was rather
sordid.

Thurs. Mch. 18

Trip to Long Reef with
Mr. G.D. Osborne (see monograph
outline). Good day - what a
place for photographic studies
in marine erosion!

To Sydney Hotel for dinner
& visit with Mr. & Mrs. Watson.

Fri. Mch. 19

Went to ocean beach in A.M.
Packed, etc. in afternoon. Watson
called in evening & took us to
Jamaica Inn - truly missing Lawrence
whom we had invited but thought
not coming.

Sat. Mch. 20

Sailed about 10:30 from London

50
Ride on "T.S. & Umanoo" (of
Hobart Parker). Watson, Sargen,
& Osborne at wharf to see us off
with colored steamers & boat-
wishes. Umanoo in small steamer
but has good accommodation. We
are comfortably situated in a
2 bath billy cabin.

Sun. Calm - worked on pictures and
typed, etc. Map in P.M. Make up & had to
leave about 10:30 but steam & had extra
Sun. March 21

Calm - up early - worked till
10:30 on pictures, etc. - all up to date
now. Typed these.

Rough with 3 strokes &
lost a couple of bits in afternoon &
a few more in evening.
Mon. March 22

Typed on above. Make
& set over with 3 strokes

begin

Windy (no steamers), Rona (under sail) &
[Rona in sail] She continues
under sail & makes no net behind -
there is big swell, however, that
makes her roll quite a bit.

Tues March 23

Typing, Ledge (one 5th defect)
- handle of Mr. Kory & Scott partner
& late to bed. Bad throat. Sybil
& Kings in P.M.

Wed March 24

Left in a boat most all morning
- ran down east coast of north
island & put into Auckland - got
Rangitoto about noon. Had lunch
passed & went up town to engage a
room while drinks were coming
out. Arrived at Metropolitan
@ 13:15 (conclusive tariff)
Drinks not even unlocked!
Called C.P.L. - no mail here
Called Burns for letters.

62
Slept all in eve & ate supper
Thurs. Mar. 25th

Searched all morning for
quarters & found flat on upper
Symonds St. for 35/ per week.
Moved in. Expense about town
compact, etc. Early to bed.

Fri. Mar. 26th

Rainy & dull all day. Home
in AM. - typing, etc. Rec. call
from C. L. - all well at home.

To King's wharf & boarded
Schooner "France" of Whitney South
Sea Expedition. Mr. Bick met on
board but met Mr. Carey (?) a
Portuguese collector. Later met Mr. Bick
& had chat. Met Bick later. Home
to good supper. Typing, etc. in eve.

Sat. Mar. 27

To call on Mr. Hartman,
Head Lecturer of Dept. of Geology
at University. He presented our
letter of introduction from Prof.
Cotton. Mr. Hartman offered to
take us to lava cave on Mon.
& will have us out to house, etc.

To Auckland Museum in
P.M. Mr. Usher is now curator
since Mr. Cheesman death. Mr.
Shaffer is asst. Curator. Neither
were in at time of my visit.
Museum has wonderful collection
of Maori material - a large
war canoe some 80' long & 7'
wide, house, carvings of all sorts,
stone implements, etc. Another
interesting collection is a case
filled with kauri gum - some
cut & polished. Last museum
involute yard, foreign collections.

63

small. But beautifully colored
a mottled or natural pattern
- consisting of flat gold and grey
but change of life etc. but not
run off with water - fine for
also. That. Several good habitat
groups - live, type etc. & an excellent
group of bones - showing about 9
bones, a set with egg etc. Most
of animals shown on old fisherman
mounts. Many fossil bones
discovered!

To the Cathedral Volcano in
"The Eagle" at the Magazine in our
- window shopping afterwards,
Tyng.

Sun Mar. 28

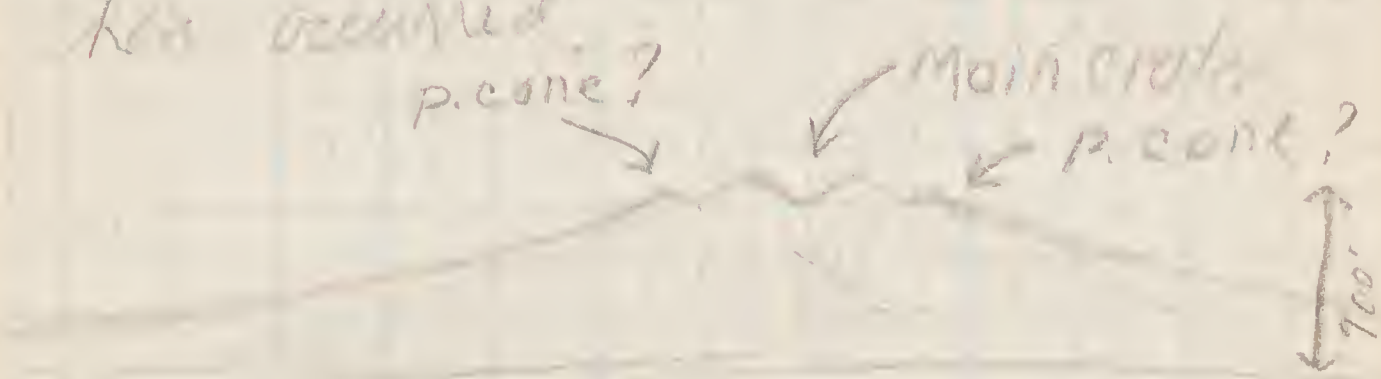
Took 11:45 AM steamer for
Rangitoto, an extinct crater some
900 ft above sea level in Auckland
harbor. A beautiful crater with

very gentle slopes which are
the top of small, parasitic craters.
It being low tide we spent the
first couple of hours in collecting
marine invertebrates along the shore.
Pough blocks of recent black
lava make up the shore. Deposits
are filled with shelly mud. Collecting
excellent. Large numbers of red
brachiopods (*Terebratula* sp.?) in
colonies on underside of lava
blocks. Seen to be 2 species of about
same size, shape & color - one brown,
strongly ridged, ^(conspicuous) these may be unusually
coarse lines of growth. Similar
but smaller than one collected
by Hutton on Tawa in H. Gulf.
No urchins or asteroidea or holothurians
or serpent stars seen. Many gastropods,
Turks, Turpins, etc etc (see above).
Many clatons, says one more

abundant near high tide mark
 seen smaller or more plentiful near
 point of lowest tide (in distance)
 small form with long narrow girth
 - in the plant growth? Small
 black mussels in groups near high
 tide - washed by fellows further
 out, groups of limpets in fibrous
 mats! Attached oysters abundant
 near etc. - few large fellows
 loose in rapid ^{current} near high tide (collected)
 No limpets - guess not too rough -
 chelone can accommodate themselves.

On to summit - good path - almost
 in house with - lava flows
 showing on surface with patches
 of rough slopes where cooled
 surface buckled - sparse vegetation
 everywhere. Practically all floor
 lava solid steep face of cone as
 reached - here black ash,

red ash, bombs, etc appear &
 slopes are of loose rock. Bedding
 rare. Descended into crater
 after taking pictures. A few
 ash beds are seen in place, most
 red & black - some are layers
 filled with bombs - see specimens.
 Little vegetation but much slumping
 has occurred.



Side trip to see lava "cave"
 but as we had no light or candles
 we saw only entrance. There are
 tubes representing old lava flows
 roof hardened & liquid beneath
 flowed on - very rough. Saw
 on floor where lava seems to
 have flowed over it diff - pres-
 entation shown

Collected - 3 clumps in crater, red scoria
in crater - black flow lava from
flat slab on slope.

Mon. March 29.

Typhoon in early morning.
Mountain before noon & received
mail forwarded from Surig.
- real straight through the
lunch hour & finished last
letters while en route to meet
Mr. Bartram at the University.
Out Davao way to Dr.
Scott's home where we were
conducted through lava cave.
The entrance is a hole in the
lawn! The cave are tube
like with rough walls

covered by tiny lava pendants.
Ropy structure, whole, etc. developed.
In places floor is concave
where a second flow broke
through & solidified in place.
These caves probably extend for
nearly $\frac{3}{4}$ of a mile. The flow
came originally from the cone
now known as "One tree hill".

Home in evening.

Tues. March 30.

To museum for short time
in A.M. - about town in
afternoon trying to get ss.
lookings, etc.

To Bartram for supper
in evening. Min. Yates, lecturer
of geology, also attended. Met
Mr. B. who is very pleasant.
Like Bartram a bit better, though
he still appears a bit old minded.

Home at midnight
Wed. Mch. 31st

Spent morning with
Eastern visiting area in
vicinity of Milford & Castor Oil
Bay. Saw beautiful & highly
complex faulting in shales &
sandy beds of Waianae fm.
Thrusts & folds are most intricate
& according to B. are not due
directly to vulcanism.

To museum in P.M. &
home to work till 9:30.

Thurs. April 1st

To museum where Mr.
Suffer introduced me to
new curator Mr. Archie, a
very pleasant young man who
gladly agreed to give me space
in which to prepare my

part. Mr. Suffer gave me a
note to Mr. Munro of the
fish market. No luck! all sold
out but scrappy stuff & no
trout here in late March! (& I
leave Tue for Palmyra!). Explanation
lies in prolonged Easter celebration
here - all shops close for several
days!

Met Mr. A. H. B. Powell at
his home. Mr. Powell is a
commercial artist by profession &
an A.I. systematic archaeologist
on the side. Beautiful & complete
collection of modern molluscs
of all sorts. Also some Tertiary
fossils. Presented me with
brachs. & papers & promised
a big series of modern genotypes.
Will be glad to identify or
check any or all of my

Figian modern stuff. I shall
give him duplicate. He
is evidently a very careful
& competent worker & I am
much impressed. His
drawings of specimens are
excellent. Also has done a
lot of landscape painting.
Wanted Paleocene fossils.
None in every-where etc.

Fri. April 2.

Worked at home till noon.
To Miffland opposite Rangitoto
on boat coast in P.M. Collected
all afternoon. Good series of
gastropods, few brachiopods, no
brachiopods (which is strange as
they were found under exactly
similar conditions close by at Rangitoto)
few ostracods, no Opheodonta, etc.
etc. Worked at home in eve.

Sat. Apr. 3rd

To Zoo in A.M. - met
Curator, Mr. Griffe, who showed
me through. Then zoo here is
less than 3 yrs old but still
remarkably good & with fine
provision for future development.
Mr. Griffe has recently returned
from a trip to Africa, bringing
home a fine collection of animals.
Park well laid out & pays for
itself (1/2 adults & 1/2 children).
Poles are just excellent. Saw
last of Antarctic penguin in
a very sick state.

Worked at these till late
after supper.

Sun. Apr. 4.

Visited (visited?) to summit of
Mt. Eden in A.M. This is a

Home site situated in
wooded paper in low wooded
road, woods around to the
summit which is flat topped
and a large symmetrical
crater 150-200' diam. Outcrop
of scoria & ash en route to top.
Pictures.

Home for rest of day, - working
on them, etc.
Mon April 5th

To Museum & fish market
but no luck on holiday.
Still continue! Long talk with
Mr. Bick of Finance in P.M.

My first impressions of the much
discussed gentleman are very favorable.
Spent rest of day & evening on chance
packing, etc. Late to bed.
Tues. April 6th

Packed specimens, etc. &

off in 11:00 a.m. train for Vancouver.
An uneventful trip on a rotten
train till after dark. (due in about
5:20 but here on hour or so late).
Train chilly, dusty, & filled with
squalling babies, etc. Many stops for
tea & refreshments. Broken spring
on 2nd engine also delayed us.

To Hamilton House for good
accommodation - 95 each per day
inclusive. Tax. To see Iron
Horse - a fine picture & about town.
A street carnival has "Crackpot"
as "the latest American craze" &
a merry-go-round goes under the
name of "roundabout".

Wed. April 7th.

Up for the usual tea at 7:00
which I enjoyed in bed a half
hour & at 7:30 for an
8:00 o'clock breakfast. After eating
we walked to shore of Lake

Return and along the path
crossing the stream. There are
hot & cold with gray water
with now & then a bubbling
hot spring or steamy jet of
with sulphurous emanations.
The air is impregnated with
 SO_2 , H_2S , etc.

Returning to the main
road we struck south to Whaka
Labat for Whakarewareware - th.
Wh. being pronounced like an f.)
about 2 miles from town. The valley
at this point is filled with
thermal activity of several sorts.
There are numerous boiling
springs of all shapes, sizes &
colors, several geyser and well
built terraced cones of siliceous
sinter. These latter are bubbling
& steaming & shooting drops

a few feet into the air and
more really played during
our visit. There are hundreds
of steam vents & there also are
of all sizes, shapes & colors. Almost
every creek or course has a
whisp of steam arising, usually
without noise but now & then
it is so constant that passes.
There are mud pots filled
with dark gray slimy mud which
is only slightly gummy to the touch. These
bubble slowly & regularly & (where
the mixture is thick) the mud
from each broken bubble falls
back with a "plop" - a series of
concentric rings are developed which
are the "mud flowers". There is a
region of beautiful sight & wonderful
smells.

Color by (between Whaka proper

and the Great Forest Reserve
Missing a number of Maoris were
doing their cooking over steam
vents & in natural hot water.

An old Maori village below where
the main thrust area has been
turned into an exhibit. Here we
saw a number of interesting carvings
& other Maori work.

After late luncheon we walked
about town, visited the stone
sanctuary grounds, bath house,
etc.

In evening we attended a
Maori entertainment & were much
amused by the Haka & many
other dances & songs (see program)

Wrote long letter to folks & went
late to bed.

Thurs April 8th

Awake at 930 on the

Sun-Lake trip. Leaving in
town of Rotoma at the southeastern
top of L. Rotoma (No. 1 of 6 lakes)
the motor took the road past
Whakareia & the Great Forest Reserve
around the southern tip of the lake
& northward along the eastern shore.
Had a view of Mokoroa Id in
L. Rotoma - our guide states that
this is not a crater. Reaching
eastward near the north end of
the lake we stop at Takitere (hot
springs). This is an interesting
area much like Whakareia. Hence
we see the character of the place.
There is a large volcanic field with
vents, mounds, etc. On beyond
express to the same - a Maori
woman visited the place & stopped
onto one of the hot pools. Luggage
brought up only her Taki which

about the end of the road
was a small at 1st - Went
up to Tiktare, hot waterfall,
etc.

Went from Tiktare to shore
of L. Rotote (small lake) (2)nd part
was a Mass shale, beds of
black siltstone etc. To famous
Hongi track which leads through
magnificent native "bush" -
giant tree ferns, etc. To Lake
Potochu (3), a hidden lake, - a
beautiful basin. Stopped at Hot
Soda spring for a taste of its
clear vile water! To Lake Rotoma (4),
a clear lake. Here we had
lunch.

Returning through Hongi track
we take a side trail to see
L. Okatauna (5), a beautiful body
of water which lies south of

L. Rotote & north of L. Tarawera.
To see L. Okatauna we went
through miles of magnificent
bush - past a small crater lake, etc.

Back to main road &
return to Tiktare taking side road
to visit L. Lake, Rotokawan,
a crater lake.

Back to Rotoma by same
route arriving about 4:30

In a plunge in the "Pukitapu"
& early to bed
Fri April 9th

Took famous "Government Road" to
see of Tarawera eruption. Left
Rotoma by auto about 10⁰⁰ AM.

& hiked SE around southern edge
of L. Rotoma. Past Whaka, Government
Forest Reserve, Tikitapu Bush etc. &
sight of buried Maori villages of
Te Wharua (part Blue [Tikitapu])
Lake & head of Green [Rotokakahi]

here). At the Whareroa saw
 saw remains of Tararua Heights
 (at the top) a collection of
 objects salvaged since the eruption.
 These included crushed glass, preserved
 fresh "petrified ham", metal articles
 of all sorts etc. Many were covered
 by encrustation of white (silica?)
 material. On the shore of Lake
 Tararua (SW corner) - here
 a short distance away from the
 shore & on the road cut could be
 seen a thin stratum of carbonized
 vegetation separating the Tararua
 deposit from the results of previous
 outbursts. Only a foot or so of the
 former here. Practically no lava
 over the Tararua lava.

Boarded launch & crossed Lake T.
 going due east & turning south then
 narrow passage & across southern

bay. Site of another buried
 village here. Good view of
 Tararua & its cleft, side
 craters etc.

A short walk brings us to
 north shore of L. Rotomahana
 which is crossed by launch going
 south & southwest. Splendid view
 of Tararua, craters, small crater
 along edge of lake, bad land topography,
 steaming cliff, etc. Now cliff
 water is boiling.

Proceed west on foot up valley
 to site of what were at one time
 the world's largest geysers, Waimangu.
 Walk up is 2-2½ miles - many
 boiling springs, steaming scoria etc.
 The site of Waimangu is now a
 hot blue lake in a deep pit open
 on the side toward what
 were formerly "Frying Pan Flats"

Letter is now a boiling lake with
steam vents & its border.

To old accommodation house
- now unroofed & in ruins.

Back to Rotorua by motor - All
soil here under Tararua material
is rubble for some distance
along road. - part low area
that sank at time of Tararua
eruption. Return by 3:30 P.M.

To Ohinemutu north of Rotorua
- Maori village where photographers
are not allowed, looking over steam
vents, etc. Canoe with beautiful
carriage & in yard a steam
jet between 2 grasses!

To mud pits & hot springs
& mud volcano nearby.

To "Butcher" in eve.

Sat April 10

By train to Auckland.

Leaving Rotorua at 9:30. Out to
Mt. Royal apt. Work on Mag
paper, etc for balance of day.

Sun April 11.

Work at home all day.

Mon April 12.

Amangia looking on Amangia
etc & part balance of day packing
specimens, working on Mag paper,
etc. Budge with Miss Rennie &
Mr. Hallum in eve & packing
later.

Tues April 13

Head running about position
to sailing. Saw Rotorua for
a few moments & took picture
about town. Sailed about 5:00 P.M.
from Rotorua Wharf on Amangia
Budge in eve with Rennie
& a Miss Selby.

Wed. Apr. 14
Up at 6¹⁵ + typed letter to
Mr. Court before breakfast. Also
looked over my morning paper -
found a lot + Mike had an
order in tea - though not actually
in. Budget in m. with Lament
+ Mar. Kelly

Thurs. Apr. 15

Up at 6¹⁵ + typed letter to Brown, etc.
before breakfast. Letter to Tyson, Sherr,
+ Landon + Harrell during day. Also
read "Oh, Money, Money!" (Baker) +
enjoyed it some. Mike slept most
of day - but rose up for supper
+ all evening.

x Ray News. To bring center of
Carmel from Honolulu on west
south side of Oahu.

x Book letter - "Songs of a Sentimental
Blake" by C. J. Dennis - Cornstalk
Book Co. Standard Plan. - 1 vol.

Fri. Apr. 16

x Up at 6¹⁵ or used letter to
Dell, etc. before breakfast. Am getting
a letter of intro (to follow) to Mr.
J. S. Wilson who is from Milwaukee
- going to Toronto to work. He could
undoubtedly work with Bruce.
(Also "Luna" about 3:30)

(See B.M.H. II)
p. 9

SUVA TO VANCOUVER

Fri. Sept. 3rd

Sailed about 3¹⁵ pm on B.M.S.
"Mazara". Sea calm, good
accommodations. Long talk with
Hoffman in evening.

Fri. Sept. 3rd

Crossed date line + we still
have Sept. 3rd today. (Wednesday)

on lecture all morning. Received
letter from Mrs. H. Wood-
ward. I. J. Jackson
with Hoff & moved my lunch
W. J. M. - visit with Bodie
(arrived at St. Andrew - Honolulu) &
Hoff & Otergaard in evening.
Sea calm - much warmer.

Sat. Sept. 4th

Left Honolulu - desert
for night - had dinner & took
stomach pump. Talked till late
with Hoffmann.

Sun. Sept. 5th

Had lunch by separate,
Vancouver, Seattle & report for
Brazley on your work. Talked till
late with Hoffmann. Felt OK
today. Sea remains calm.
Back to Mary's & Dr. Lee.

Spent afternoon in
superior degree in sea. Also
passed close to Oahu's coast
in the afternoon.

Mon. Sept. 6th

Letter to Vaughan, etc. in A.M. &
4 hrs. study on paleontology. Later.
Talked with Etnell, Hoff, Otergaard, &
Bodie in eve. Late to bed. Sea
still calm - weather in rough
water.

Tues. Sept. 7th

Finished Fiji reading & spent
in 3 hrs. study on Paleontology.
Mr. Bodie of Henderson Co. arrived
at St. Andrew's in the eve. He has
fossils collected from Sagalah-
Vatu with Hoff & Otergaard in eve.

Wed Sept 8th

30

Section of str. in
ferry crossing, & through bridge
on morning with Hoff, Chang,
& Emma. etc.

Thurs Sept 9th

In afternoon noon. Writing
first Program report & studied
Baker. Then in evening

Fri Sept 10th

My car was approaching
Abolition - great summer

Gregory & J. F. Illingworth
at dock. Cleaned P.M. stuff
& Gregory drove Hoff & I to
Museum for conference. I
like Gregory. Lots talk
with Cooke & discussed
shells which pleased him.
Long talk with Gregory

about my work - a very
satisfactory talk. Barker
prepared summary, etc. gave
his OK on my giving a
report of progress at C.S.A.
Also Fred Hoff & Ladd
paper on bench. Does not
think much of glacial
theory for origin of bench.
Must first stress interpretation
of origin. Program report
to appear in abstract
in C.S.A. Bull - Hoff & Ladd
paper to be given orally
Then sent on to Gregory
for publication in Am.
Jour. Sci. Soc. of that or
P.M. Oked. Geog. article
all got negative to B.M.
x later told him of hope
to work in Wash D.C.

31

next summer & of hope
to turn in main mass
by Jan 1st 1928. Gave
me \$300⁰⁰ cash, promised to
pay all freight bills, &
photograph bills (at least
up to 100⁰⁰ for photos).
Map can be handled OK.

x. Will consider Wright
collection purchase &
write me so on I can
communicate with Wright.
I don't sell his collection
but temporarily.

Talk as though my
return to the part of world
is a certainty. I mentioned
New Hebrides plan - OK.

x. In report became
land area during Pleistocene
or compared with land

area on Vito last year.
Probably more now than
then - hence no land
bridge for Pleistocene man
to walk over!

Suzon & I agree on
recent work on Fiji.

Talk with Stokes about
skull - ~~to the skull probably~~
~~marine~~ - note observed by
rat (not mangrove) - an
endemic rat - looks (Tellina?)
surely marine - large gastropod
* fragment - doubtful - fossil
Stokes. Also have him
OK popular article - Skull
in Accur # 810.

To go on with (Suzon)
& clear \$300⁰⁰. If Mayara
to leave govt. will send mail
- P.O., lunch etc. finally
ending up at Univ.

of Hawaii - Blum may
be leave tomorrow
for year away. May
return via Detroit & drive
back out. I ~~may~~ not have
anything to contribute on
the sea paper - so be
there

Met Blum's temporary
successor - Mr. Freeman &
drove me to ship

Letabell, Campbell, Guyon
& Bonga to see us off.
- photo for paper - & good
bye to Hawaii - temporarily
Talk with Hoffmann
in evening

Sat Sept 11

Work & talk with Hoff
all morning. Looked out

of all day. Some (noon) &
page fight in evening.

Sun Sept 12th

Studied some hours, etc.
With Hoffmann most of day &
evening. Weather decidedly
cooler today - are in
latitude 25° about noon.

Mon Sept 13

Studied some but not
most of day. Worked a lot at
paper in evening.

Tues Sept 14

Studied Ever. Spent most
of day. Took a party with
Mr. Font. Spent some time
evening - but a lot.

Wed Sept 15

Rough notes. Studied
about road between
1000

Thurs. Sept 16th

Went down in afternoon
to Vancouver in evening. Went
shore with Hilly, Loomis, &
Young - Scipio road station - 2
lot haulage, 1 lot of 2 pieces
of lime for later. Put down lot
to look to sleep.

Later some more from
Miller.

Fri Sept 17th

Day in Vancouver - left at
7:30 p.m. in 2nd section of
9:00 train. On riding day road
with Loomis, Young & Miller
Smith.

Spent day dropping at
Crest but connect with Brook
Sent some to Miller & Deal.

Sat Sept 18th

Through into road, left
about at recovery (one piece
2.00 - Young) - left 2.00
1 bulge.

Sun Sept 19th

Real most of day. Left
getting into Upper Saw cross
into Ch. 5 at Patal about
midnight. Saw ^(over) road &
examination by Cadman.
Luggage station at Patal - we
luggage station at Patal
and stop.

Mon Sept 20th

Same kind of day
we left. Arrived in St Paul

late & missed P. I.
connection. To hold for
night with Young &
Lyons. Landed
former \$5.00

Tue. Sept. 21st

Took 9¹⁰₂₀ P. I. for
Caden Rapids.

Date _____

